Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules	)	ET Docket No. 98-237
With Regard to the 3650-3700 MHz	)	RM-9411
Government Transfer Band	)	
	)	
The 4.9 GHz Band Transferred from	)	WT Docket No. 00-32
Federal Government Use	)	

FIRST REPORT AND ORDER AND SECOND NOTICE OF PROPOSED RULE MAKING

Adopted: October 12, 2000 **Released:** October 24, 2000

Comment Date: [30 days from publication in the Federal Register]
Reply Comment Date: [60 days from publication in the Federal Register]

By the Commission:

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I. INTRODUCTION

1. By this action, we allocate the 50 megahertz of spectrum in the 3650-3700 MHz band to the fixed and mobile (base stations) terrestrial services on a primary basis. This allocation will facilitate the provision of a broad range of services, including traditional voice telephony and new broadband, high-speed, data and video services. We also believe that this allocation will help foster the introduction of such services to rural areas of the United States, thus promoting the objectives of Section 706 of the

Telecommunications Act of 1996 to facilitate the rapid deployment of advanced telecommunications services and technologies to all Americans.[1] This action will also encourage new and more effective competition to existing wireline local exchange carriers by providing for an economical means to offer competitive "local loop" or "last-mile" facilities.

2. We are "grandfathering" existing fixed satellite service ("FSS") earth station sites in this band and, for a limited time, will accept new applications for FSS earth stations in the vicinity (*i.e.* within 10 miles) of these grandfathered sites to operate on a co-primary basis in the band. We will also permit additional FSS earth station operations on a secondary basis. This will ensure the continuity of FSS operations and permit new FSS operations to help alleviate congestion in the adjacent 3700-4200 MHz FSS band. Finally, to provide for compatibility with both terrestrial fixed service and FSS operations in the band, we are limiting the terrestrial mobile service use of the band to base station operations.

3. In the Second Notice of Proposed Rule Making ("*Second Notice*"), we also propose licensing and service rules for the assignment of fixed and mobile services licenses in this band by competitive bidding. Both new and existing FSS earth stations will be subject to Part 25 of the Commission's rules. Parties who wish to use this spectrum for FSS will have to comply with the Part 25 application and licensing rules. Those who wish to provide fixed and mobile services in the 3650-3700 MHz band will be subject to the application, licensing and services rules we adopt in this proceeding. We propose that 3650-3700 MHz licensees who obtain licenses pursuant to the rules we adopt for fixed and mobile services and who subsequently choose to offer FSS in this band may retain their 3650-3700 MHz licenses if they meet the proposed FSS build-out requirement.[2] These actions and proposals are designed to benefit the public by permitting and encouraging the introduction of new services, particularly in rural areas.

II. BACKGROUND

4. The 3600-3700 MHz band has been allocated for use by the Federal Government on a primary basis for radiolocation services. In 1984, a primary allocation in the 3600-3700 MHz band was added for non-Government FSS (space-to-Earth), but US245 footnote restricted use of this FSS allocation "to international inter-continental systems . . . subject to case-by-case electromagnetic compatibility analysis."[3] The allocation was aimed at meeting "future INTELSAT projected

[1] *See* Pub.L. 104-104, Title VII, § 706, Feb. 8, 1996, 110 Stat. 153, reproduced in the notes under 47 U.S.C. § 157 ("Section 706"). Section 706(c)(1) defines "advanced telecommunications capability . . . without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data graphics, and video telecommunications using any technology." *See generally Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket 98-146, Second Report, FCC 00-290, (rel. Aug. 21, 2000) ("*Section 706 Second Report*").

[2] *See* ¶¶ 82-88, *infra*.

[3] *See Amendment of the Commission's Rules with Regard to the 3650-3700 MHz Government Transfer Band*, ET Docket No. 98-237, Notice of Proposed Rule Making and Order, 14 FCC Rcd at 1295, 1297-98 (¶ 3) (1998) ("*Notice and Order*"). *See also Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference*, Geneva, 1979, General Docket 80-739, Second Report and Order, 49 FR 2357 (Jan. 19, 1984).

requirements."[4] To date, approximately 82 FSS earth stations at 49 sites[5] have been licensed in this spectrum.[6]

5. Pursuant to the Omnibus Budget Reconciliation Act of 1993 ("OBRA-93"),[7] the National Telecommunications and Information Administration ("NTIA") identified the 3650-3700 MHz band for transfer, effective January 1999, from a Government/non-Government shared use status to a mixed-use status.[8] While the band is now predominately available for non-Government use, a condition of the transfer allows Government radiolocation stations to continue to operate indefinitely in the 3650-3700 MHz band at Pascagoula, Mississippi; Pensacola, Florida; and Saint Inigoes, Maryland. NTIA states that the "radius of operation" for these radiolocation stations is 80 kilometers (49.7 miles).[9]

6. Pursuant to the Balanced Budget Act of 1997, NTIA was required to identify 15 megahertz to be reallocated from Government to non-Government use for assignment by competitive bidding within the range 1990-2110 MHz, or to identify alternative spectrum.[10] NTIA subsequently identified the following frequency bands that could be assigned by competitive bidding as a substitute for the 15 megahertz: 944-960 MHz, 1390-1400 MHz, 1427-1432 MHz, 1670-1675 MHz, 2500-2690 MHz, and 3650-3700 MHz.[11]

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[4] *See Notice and Order*, 14 FCC Rcd at 1297 (¶ 3).

[5] *See* Appendix F. Earth stations that operate in the 3600-3700 MHz band require coordination with NTIA. We note that the earth stations listed in Appendix F are being coordinated with NTIA. We are working with NTIA to ensure that all earth stations are coordinated.

[6] Footnote US245 to the Table of Allocations states that "The fixed-satellite service is limited to international inter-continental systems and subject to case-by-case electro-magnetic compatibility analysis." These numbers include four earth stations at three sites used to provide Telemetry, Tracking and Control ("TT&C") functions for satellite systems. Section 25.201 of the Commissions rules defines TT&C operations as follows: Space Telemetering is defined as the use of telemetering for the transmission from a space station of results of measurements made in a spacecraft, including those relating to the functioning of the spacecraft; Space Tracking is defined as determination of the orbit, velocity or instantaneous position of an object in space by means of radiodetermination, excluding primary radar, for the purpose of following the movement of the object; and Space Telecommand is defined as the use of radiocommunication for the transmission of signals to a space station to initiate, modify or terminate function of the equipment on a space object, including the space station. *See* 47 C.F.R. § 25.201.

[7] *See Omnibus Budget Reconciliation Act of 1993* ("OBRA-93"), Pub. L. No. 103-66, Title VI, § 6001(a)(3), 107 Stat. 312 (enacted August 10, 1993). *See also* H.R. Rep. No. 103-213, 103rd Cong., 1st Sess. (1993).

[8] *See Spectrum Reallocation Final Report, Response to Title VI - Omnibus Budget Reconciliation Act of 1993*, NTIA Special Publication 95-312, released February 1995 ("*Final Report*"). Shared use means that a band of frequencies is generally available for both government and non-government use. *See* 47 C.F.R. § 2.105(b). Mixed use means that government use is limited by geographic area, by time or by other means so as to guarantee that the potential use by government stations is substantially less than the potential use to be made by non-government stations. *See* Section 113(b)(2)(B) of OBRA-93. *See* 47 U.S.C. § 923(b)(2)(B).

[9] *See Final Report* at Sections 4-16 through 4-21.

[10] *See The Balanced Budget Act of 1997*, Section 3002(c), Pub. L. 105-33, 111 Stat. 251-258 (1997) ("BBA").

[11] *See Identification of Alternate Bands*, NTIA Special Pub. 98-39 (1998), at 25-29.

7. In the *Notice of Proposed Rule Making and Order* ("*Notice and Order*") in this proceeding, we proposed to allocate the 3650-3700 MHz band on a primary basis to the terrestrial fixed service ("FS") and proposed to grandfather existing FSS earth station sites in the band.[12] In the *Notice and Order* we tentatively concluded against proposing a mobile service allocation in the band.[13] We sought comment on this tentative conclusion, and alternatively, whether we should allocate this band to the land mobile service.[14] Additionally, we sought comment on the need to delete the FSS allocation in the 3650-3700 MHz band in order to preserve the availability of the band for use by the proposed FS.[15] We also proposed to delete the non-Government radiolocation allocation in the band.[16] Further, we proposed to delete the Government radiolocation service allocation, except for three grandfathered sites.[17] We also proposed to delete the unused Government aeronautical radionavigation service (ground based) allocation.[18] We also sought comment on whether to assign licenses in this band through competitive bidding and what would be the optimal size of the licensing blocks and service areas.[19] Moreover, we sought comment on appropriate service rules for fixed service operation in the band.[20]

8. In the *Notice and Order,* we stated that we would no longer accept applications in the 3650-3700 MHz band for: (1) new FSS earth stations, (2) major amendments to pending FSS earth station applications, or (3) applications for major changes in existing FSS earth stations. This action was intended to ensure that adequate opportunities would continue to exist for the provision of fixed operations in the band.[21] Subsequently, we adopted a *Memorandum Opinion and Order* ("*MO&O*") in this proceeding modifying this decision to provide limited relief from the FSS earth station application freeze for immediate needs.[22] Specifically, the *MO&O* stated that the Commission would accept new and major change applications for FSS earth stations and major amendments to pending applications if the subject facilities were located within the vicinity (*i.e.* 10 miles) of an existing FSS earth station operating in the 3650-3700 MHz band.[23]

9. A total of 27 parties filed comments and 18 parties filed reply comments in this proceeding.[24]

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[12] *See Notice and Order*, 14 FCC Rcd at 1295-96, 1299-300, 1305-06 (¶¶ 1-2, 6-7, 13).

[13] *See Notice and Order*, 14 FCC Rcd at 1299-300, 1308 (¶¶ 6, 17).

[14] *Id.* at 1308 (¶ 17).

[15] *Id.* at 1306 (¶ 14).

[16] *Id.* at 1307 (¶ 15).

[17] *Id.* at 1307 (¶ 16).

[18] *Id.*

[19] *Id.* at 1303 (¶ 10).

[20] *Id.* at 1302-05 (¶¶ 9-12).

[21] *Id.* at 1296-97 (¶ 2).

[22] *See MO&O*, 15 FCC Rcd at 9341 (¶ 4).

[23] *Id.*

[24] A complete list of commenters is contained in Appendix A.

The majority of the comments were submitted on behalf of telecommunication providers that serve predominately rural areas of the country, terrestrial equipment manufacturers, and satellite operators.

III. DISCUSSION

A. Reallocation of the 3650-3700 MHz Band for Non-Government Operations

1. Allocation

a. Terrestrial Fixed and Mobile Services

10. In the *Notice and Order*, we proposed to allocate spectrum in the 3650-3700 MHz band on a primary basis to the non-Government fixed service.[25] In making this proposal, we envisioned that this spectrum would be used for a broad range of services, such as traditional voice telephony and a wide variety of new broadband, high-speed, digital data and video services that could be used for both home and business applications.[26] We also recognized that this spectrum may be well suited for wireless connections to the public switched telephone network ("PSTN").[27] We noted that this could provide an economical means to offer competitive "local loop" or "last-mile" facilities, which may lead to more effective competition to existing wireline local exchange carrier services.[28] This type of service is known as Fixed Wireless Access ("FWA"). We also noted that commercial deployment of FWA has already commenced internationally in the 3400-3700 MHz band in several countries.[29] We tentatively concluded that terrestrial mobile operations would not be compatible with the incumbent FSS earth stations.[30] Specifically, we noted that the Commission has traditionally licensed satellite downlinks[31] in bands that are not used by mobile services because of the difficulties associated with sharing of spectrum by low power satellite receive signals and roving mobile units.[32] We sought comment on this tentative conclusion, and alternatively, on whether we should allocate the 3650-3700 MHz band to the land mobile service.[33]

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[25] *See Notice and Order*, 14 FCC Rcd at 1295-96, 1299-1300 (¶¶ 1, 6-7).

[26] *Id.* at 1295-96 (¶ 1).

[27] *Id.* at 1299-300 (¶ 6).

[28] *Id.* at 1295-96 (¶ 1).

[29] For example, the Mexican government has specified that the 3400-3700 MHz band is to be used for local wireless telephony and has recently auctioned this band. Australia also has just announced an auction. The Canadian government has authorized trials of Nortel's Proximity-I system, which is also used in the United Kingdom. *See also* "Update on Fixed Wireless Access in Canada (Updated paper)," at http://www.tsacc.ic.gc.ca/RAST6/DOCS/rast-6-14.html. Domestically, Lucent Technologies and Interdigital Communications Corp. are conducting fixed wireless access ("FWA") experiments in the 3400-3600 MHz band for the export market. Mountain Telecommunications Inc., ("MountainTel") has an experimental license, 0041-EX-ML-1999, for FWA service in the band.

[30] *See Notice and Order*, 14 FCC Rcd at 1299-300 (¶ 6).

[31] Note that FSS earth stations in the 3650-3700 MHz are authorized as space-to-Earth operations (i.e. downlinks).

[32] *See Notice and Order*, 14 FCC Rcd at 1308 (¶ 17).

[33] *Id.*

11. Several telecommunications service providers, particularly those serving rural areas, and fixed service equipment manufacturers expressed support for allocating the 3650-3700 MHz band on a primary basis to the fixed service. [34] They agree that a fixed service allocation will permit the introduction of new services to the public and will provide a means for delivery of advanced telecommunications services to rural and traditionally underserved areas of the U.S.[35] In particular, parties representing rural entities believe that a fixed service allocation will allow telecommunications providers to employ potentially cost-effective wireless technology for the deployment of advanced broadband communications services, such as wireless Internet access, in rural areas of the country.[36] Some commenters requested that we allocate additional spectrum in the 3400-3650 MHz band in conjunction with the 3650-3700 MHz band to improve the economic viability of the fixed service.[37] Two commenters note that MountainTel and Saddleback Communications Company ("Saddleback") filed a petition for rule making ("MountainTel/Saddleback petition") on September 30, 1998, requesting that the Commission allocate the 3400-3700 MHz band for use in the provision of FWA by telecommunications carriers.[38] Several parties supported the Commission's tentative conclusion not to provide a mobile service allocation in the band.[39] No comments were filed supporting a mobile service allocation in the 3650-3700 MHz band.

12. Satellite service providers objected to the Commission's proposed fixed service allocation if done in a manner that precludes expansion of FSS. For example, ImpSat USA ("ImpSat") and Wold International, Inc. ("Wold") assert that the proposed fixed service allocation will prevent continued access to the 3650-3700 MHz band and would cripple the development of international telecommunication services provided by the FSS operations in the band.[40] PanAmSat Corporation ("PanAmSat") is concerned that the proposed fixed service operations will cause interference to FSS

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[34] *See, e.g.* CommNet Cellular, Inc., Kerville Telephone Company, Lincoln County Telephone System, Inc., Minnesota Southern Cellular Telephone Company, Penasco Valley Telephone Cooperative, Inc., Ringgold Telephone Company, Sully Buttes Telephone Cooperative Inc., 3 Rivers Telephone Cooperative Inc. ("Rural Carriers") comments at 2-3 and reply comments at 1; Cheyenne River Sioux Telephone Authority ("CSRT") comments at 1; Lucent Technologies ("Lucent") comments at 3; Motorola comments at 2; Telephone and Data Systems, Inc., ("TDS") comments at 2; The Rural Telecommunications Group ("RTG") comments at 3; SR Telecom Inc. ("SR Telecom") comments at 3; TRANSCOMM, Inc., ("TRANSCOMM") comments at 2; AT&T Corp. ("AT&T") comments at 6; and Western Wireless Corporation ("Western Wireless") comments at 1 and 5.

[35] *See* Rural Carriers comments at 2-3 and reply comments at 1. *See also*: Lucent comments at 3, Motorola comments at 1-3, TDS comments at 2, RTG comments at 3, SR Telecom comments at 3, TRANSCOMM comments at 2, AT&T comments at 6 and Western Wireless comments at 1 and 5.

[36] *See* RTG comments at 1, 4. *See also* Rural Carriers comments at 2-3.

[37] *See* CRST comments at 1, 4. *See also* SR Telecom comments at 3, 6-7; Airspan comments at 1-2; Lucent comments at 2-3; Motorola comments at 2; GTE reply comments at 6; Nortel comments at 4; and TRANSCOMM comments at 4.

[38] *See* CRST comments at 1 and TRANSCOMM comments at 5. While the Commission has not assigned a rulemaking number to this petition, it is available on the Commission's Electronic Comment Filing System (ECFS) at http://www.fcc.gov/e-file/ecfs.html under proceeding number PRM98ET, dated 09/30/1998.

[39] *See* COMSAT comments at 15. *See also* Lucent comments at 6; Motorola comments at 3; and SR Telecom comments at 4.

[40] *See* ImpSat comments at 1. *See also* Wold reply comments at 1-2.

operations in the 3650-3700 MHz band.[41] Further, COMSAT Corporation ("COMSAT") and MCI WorldCom, Inc. ("MCI WorldCom"), believe that the public interest would best be served by allowing the FSS and new fixed services to share the 3650-3700 MHz band on a co-primary basis.[42] Lockheed Martin Corporation ("Lockheed") and COMSAT believe that effective sharing criteria can be developed by establishing suitable reference system parameters for calculating coordination contours and for conducting interference analyses.[43]

13. Based on the record in this proceeding and the need to balance competing demands for this spectrum, we are adopting our proposal to allocate the 3650-3700 MHz band for terrestrial fixed service operations on a primary basis. As indicated by the commenting parties, allocation of this band on a primary basis for fixed service will facilitate the operation of a broad range of new advanced services. We believe that the 3650-3700 MHz band is situated low enough in the radiofrequency spectrum so as to permit favorable transmission characteristics which will allow the establishment of service links that can cover significant distances. In addition, 50 megahertz will provide enough bandwidth to allow for high speed digital data and video services. These characteristics should prove useful in establishing basic and advanced telecommunications services within rural areas of the country. The need for advanced services in rural areas has been well documented in recent studies. These studies conclude that Americans living in rural areas and inner cities do not have access to advanced services that are comparable to services available to people living in other areas.[44] A lack of broadband infrastructure could limit the potential of these communities to attract and retain businesses and jobs, especially businesses that are dependent on electronic commerce. Lack of infrastructure could also restrict community access to education, health care, and recreational services.[45] We conclude that allocation of the 3650-3700 MHz band for the fixed service will serve the public interest by providing broadband data services to residential and business consumers, particularly in rural areas. Additionally, this allocation will facilitate an alternative means of providing basic telephone service, thus fostering a competitive market structure for direct PSTN access for rural and underserved areas of the U.S. For example, it could be used to provide unserved persons with a wireless connection to the PSTN and to economically serve high-cost wireline service areas, including rural areas.

14. While we recognize that the desirability of providing fixed service operations access to additional spectrum, spectrum in the adjacent 3400-3650 MHz band is not available. That band is currently allocated on a primary basis for Federal Government use. The Commission consulted with NTIA concerning access to this band on a co-primary basis, but NTIA determined that non-Government fixed service operations are incompatible with the incumbent Government operations.[46] Given NTIA's determination, we do not anticipate gaining access to spectrum in the 3400-3650 MHz band in the near term and, therefore, must deny the MountainTel/Saddleback petition requesting allocation of this band for non-Government operations.

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[41] *See* PanAmSat comments at 7.

[42] *See* COMSAT comments at 17-18. *See also* MCI WorldCom reply comments at 1.

[43] *See* Lockheed reply comments at 4. *See also* COMSAT comments at 11-12.

[44] *See generally* National Telecommunications and Information Administration, *Falling Through the Net* (July 1999). *See also Section 706 Second Report*, at 6-7, 89-90.

[45] *See Section 706 Second Report*, at 88.

[46] *See* letter dated June 30, 2000 from William T. Hatch, Associate Administrator, NTIA to Dale Hatfield, Chief OET.

15. Although additional spectrum for fixed service operation is not available, we find that the 50 MHz at 3650-3700 MHz can support viable fixed service operations. We are encouraged by comments in the record indicating that technologies such as time division duplexing ("TDD") could be used to provide service in this band.[47] To further enhance the viability of terrestrial fixed and mobile services, we seek comment in the *Second Notice* on the feasibility of pairing the 3650-3700 MHz band with the 4940-4990 MHz band and whether such a pairing will encourage synergies in use of both portions of spectrum.[48] In some areas of the country it may be useful to utilize the 4940-4990 MHz band to serve areas near grandfathered FSS earth station sites operating in the 3650-3700 MHz band. In addition, given the frequency separation of these bands could allow the use of frequency division duplexing ("FDD") technology. These two bands may complement one another and allow for ubiquitous deployment of new terrestrial fixed services.

16. We decline to adopt our tentative conclusion concerning a mobile service allocation in the 3650-3700 MHz band in its entirety. Given the challenging spectrum sharing environment involving the relatively weaker satellite receive signals, we remain concerned about mobile station (*i.e.* roving handset) operations in the 3650-3700 MHz band.[49] However, while we agree with COMSAT, Lucent, Motorola and SR Telecom that mobile station operations may raise interference concerns, we find that land mobile base stations should be allowed to operate within the 3650-3700 MHz band. Mobile base stations are fixed and thus do not raise the same interference concerns as mobile handset operations. Mobile base stations in the 3650-3700 MHz band might operate with land mobile services offered in the 4940-4990 MHz band. Specifically, the land mobile base stations could transmit in the 3650-3700 MHz band, and the land mobile receivers could use the 4940-4990 MHz band to transmit back to the land mobile base station. We therefore allocate the 3650-3700 MHz band to the mobile service on a nationwide co-primary basis with the fixed service. However, we limit this allocation to base station operations only. Consistent with the international allocation in this band, we are not permitting aeronautical mobile operations. Land mobile base stations in the 3650-3700 MHz band will be subject to the same coordination procedures as FS stations concerning grandfathered Government radiolocation and grandfathered FSS operations.[50]

17. Motorola requests that the Commission allow for "nomadic" or "temporary-fixed" operation in the band.[51] Motorola indicates that "nomadic" operation differs from traditional mobile operations in that the nomadic transmissions do not generally occur when the radio is in rapid high-speed motion.[52] Motorola's description of nomadic operation does not clearly distinguish that operation from mobile

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[47] *See* Innowave comments at 2. Additionally, Rural Carriers notes that a 50 MHz block of spectrum in the 3 GHz band could potentially support wireless Internet access with data rates surpassing digital subscriber line ("DSL") services, such as cable modems into remote, rural areas of the country. *See* Rural Carriers comments at 4.

[48] *See The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, Notice of Proposed Rulemaking, 15 FCC Rcd 4778 (2000) ("*4.9 GHz Notice*").

[49] *See* 47 C.F.R. § 2.1(c). A mobile station is defined as station in the mobile service intended to be used while in motion or during halts at unspecified points. *See also* 47 U.S.C. § 3(23) (defining land station), § 3(27) (defining mobile service), and § 3(28) (defining mobile station).

[50] *See* ¶¶ 103-109, *infra.*

[51] *See* Motorola comments at 3.

[52] *Id.*

operation and we do not see a clear definitional or technical distinction. Our rules define mobile service as a radiocommunication service between mobile and land stations or between mobile stations[53] and fixed service as a radiocommunication service between fixed points.[54] Given these definitions it appears that Motorola's "nomadic" operation would fall under our definition of mobile station operations and thus not be permitted in this band. To the extent that Motorola can provide a detailed demonstration that its proposed "nomadic" operations are consistent with our policies in this band and fall within the Commission's definition of temporary fixed operations, they will be permitted to operate.

b. Sharing With Fixed Satellite Service Operations

18. In the *Notice and Order*, we imposed a freeze on the acceptance of applications for earth station operations in the 3650-3700 MHz band.[55] We proposed to permanently implement this action, but sought comment on alternative methods to meet the terrestrial fixed service needs while minimizing the effect on FSS operations.[56] While some satellite providers indicate that sharing on a co-primary basis is possible, we decline to adopt such a proposal. We recognize that fixed operations and FSS share spectrum in some bands. We will permit sharing to the extent it is technically possible and promotes efficient use of the spectrum. However, in this band, allowing FSS on an unrestrained co-primary basis would impede any potential widespread use of the band for terrestrial services. Due to the weak signals that are received in the FSS, coordination with the higher-powered terrestrial operations would result in potentially large geographic areas where terrestrial services could not operate to avoid interference to FSS. The size and shape of these "exclusion zones" may be different for each FSS earth station site because factors such as shielding, antenna orientation and terrain elevation will vary from site to site.[57] These coordination requirements and the presence of exclusion zones would significantly increase transaction costs and create a disincentive for deployment of new terrestrial operations. Thus, we find that unrestrained deployment of FSS earth stations could hinder or greatly inhibit the opportunities for terrestrial operations in the band.

c. Statutory Considerations

19. As previously mentioned, NTIA identified the 3650-3700 MHz band as a possible substitute for 15 megahertz at 1990-2110 MHz for assignment by competitive bidding pursuant to the requirements of the BBA.[58] A statutory condition of the substitution requires that alternative spectrum "better serve the public interest, convenience, and necessity" and that "the alternative could reasonably be expected to produce comparable receipts."[59] The other bands identified by NTIA as alternatives to the 15 megahertz at 1990-2110 MHz include: 944-960 MHz, 1390-1400 MHz, 1427-1432 MHz, 1670-1675 MHz, and 2500-2690 MHz. As noted in our *Spectrum Policy Statement*, the 944-960 MHz and 2500-2690 MHz

[53] *See* 47 C.F.R. § 2.1(c).

[54] *Id.*

[55] *See Notice and Order*, 14 FCC Rcd at 1296-97, 1305-06 (¶¶ 2, 13).

[56] *Id.* at 1305-06 (¶ 13).

[57] *See* ¶ 26, *infra* (discussing the difference between coordination zones and exclusion zones).

[58] *See* ¶ 6, *supra.*

[59] *See* BBA at Section 3002(a)(4). *See also* 47 U.S.C. § 309(j).

bands are already used extensively for non-Government services.[60] We also observe that portions of the 1390-1400 MHz and 1427-1432 MHz have already been allocated and assigned to non-Government use.[61] The remaining portions of these bands and the 1670-1675 MHz band are small, non-contiguous segments and thus we believe are unlikely to raise comparable receipts as required by the BBA.[62] Thus, with the exception of 3650-3700 MHz, none of the bands identified by NTIA is available to satisfy the requirements of the BBA. Because this 50 megahertz is at a higher frequency than 15 megahertz of spectrum identified in the 1990-2110 MHz band, additional bandwidth is required to compensate for increased path losses that occur in the 3650-3700 MHz band. For these reasons, we find that the 3650-3700 MHz band is an equivalent and viable substitute for 15 megahertz of spectrum at 1990-2110 MHz, taking into account differences in propagation characteristics between the two bands.

20. Because we are substituting the 3650-3700 MHz band for 15 megahertz of spectrum in the 1990-2110 MHz band, we must assign licenses for this spectrum by competitive bidding to satisfy the requirements of the BBA.[63] Our allocation to the terrestrial services will enable us to establish service rules consistent with the statutory mandate to auction licenses for this spectrum. We seek comment in the *Second Notice* on various service rules necessary to conduct an auction.[64]

21. Recently enacted legislation states that the Commission "shall not assign spectrum used for international or global satellite services by competitive bidding."[65] FSS in this band has historically been

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[60] *See Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium*, Policy Statement, 14 FCC Rcd 19868, 19880-81 (1999) ("*Spectrum Policy Statement*") at ¶ 27.

[61] *See Amendment of the Commission's Rules to Establish Part 27*, the Wireless Communications Service ("WCS"), GN Docket No. 96-228, Report and Order, 12 FCC Rcd 10785 (1997); *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, ET Docket 99-255, Report and Order, 15 FCC Rcd. 11206.

[62] *See* BBA at Section 3002(c)(4).

[63] *Id. See also* NTIA Special Publication 98-39.

[64] *See* ¶¶ 120-127, *infra*. As discussed, recently enacted legislation prohibits the Commission from assigning licenses for international or global satellite services by competitive bidding. *See* ¶ 21, *infra*. The assignment of licenses for terrestrial services by competitive bidding, however, is not prohibited by this legislation. We note that the 24 GHz band is allocated for terrestrial fixed services and satellite services, and we recently adopted rules for awarding licenses for terrestrial fixed service in that band by competitive bidding. *See Amendments to Part 1, 2, 87 and 101 of the Commission's Rules to License Fixed Services at 24 GHz*, Report and Order, FCC 00-272, WT Docket No. 99-327 (rel. July 31, 2000). Terrestrial services and satellite services also share the 39 GHz band, and we have auctioned terrestrial service licenses in that band. *See Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands*, Report and Order and Second Notice of Proposed Rule Making, 12 FCC Rcd 18600 (1997); "39 GHz Band Auction Closes", Public Notice, DA 00-1035, Report No. AUC-30-E (rel. May 10, 2000).

[65] *See Open-Market Reorganization for the Betterment of International Telecommunications Act*, Pub. L. No. 106-180, 114 Stat. 48 (2000) ("ORBIT Act"). Specifically, Section 647 of the ORBIT Act provides:

> Notwithstanding any other provision of law, the Commission shall not have the authority to assign by competitive bidding orbital locations or spectrum used for the provision of international or global satellite communications services. The President shall oppose in the International Telecommunication Union and in other bilateral and multilateral fora any assignment by competitive bidding of orbital locations and or spectrum used for provision of such services.

restricted to international, intercontinental services.[66] Given that this band is allocated for space-to-Earth or downlink services, this footnote implies that data is being transmitted from another country. Even if this restriction were not in place, the international inter-continental nature of the satellite systems deployed in this band results in a footprint that extends well beyond the U.S. border into other countries. Because FSS is, or may be, used for the provision of international satellite services in this band, we believe that the assignment of FSS licenses by competitive bidding would be inconsistent with the ORBIT Act. While we do not plan to assign FSS licenses for the 3650-3700 MHz band by competitive bidding, we are taking a number of steps to continue to accommodate FSS use of the band. Specifically, we are: (1) grandfathering existing FSS earth station sites on a co-primary basis; (2) providing a limited opportunity to request additional co-primary FSS earth station sites within 10 miles of existing grandfathered FSS earth station sites; and (3) allowing other new FSS earth station sites on a secondary basis. In addition, we note that the 3600-3650 MHz band remains available for FSS earth station operations on a primary basis.

2. Fixed Satellite Service Transition Issues

a. Existing Fixed Satellite Service Operations

22. In the *Notice and Order,* we proposed to grandfather existing FSS earth station sites operating in the 3650-3700 MHz band.[67] In addition, we sought comment on whether new terrestrial licensees should have the right to require existing FSS earth stations to vacate the band, subject to reimbursement, in a manner consistent with the Commission's emerging technologies relocation policies.[68] We also sought comment on whether we should change the allocation status of FSS earth stations to secondary after a specified time period.[69]

23. Several commenters support grandfathering existing FSS earth station sites.[70] For example, Sprint argues that grandfathering existing FSS earth station sites is important in order for common carriers to continue to provide voice and data services within the Americas using INTELSAT.[71] Some commenters objected to grandfathering existing FSS earth station sites and argue that the band should be cleared.[72] For example, SR Telecom believes that FSS operations should be relocated, but argues that relocation costs should not be borne by FS providers because they may not have sufficient market demand to justify the additional associated costs.[73]

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[66] *See* ¶ 4, *supra.*

[67] *See Notice and Order*, 14 FCC Rcd at 1306 (¶ 14).

[68] *Id.*

[69] *Id.*

[70] *See* COMSAT comments at 2 and 6. *See also* Sprint comments at 2; SIA comments at 2; PetroCom comments at 3; MCI WorldCom reply comments at 2-4; ICG reply comments at 1; and Sprint reply comments at 2.

[71] *See* Sprint comments at 3.

[72] *See* SR Telecom comments at 5. *See* also Rural Carriers reply comments at 9.

[73] *See* SR Telecom comments at 5.

24. While incumbent FSS operations could relocate to other bands that are available for FSS, relocation would necessitate significant reconfiguration costs and disrupt continuity of operations. Recognizing the importance of providing continuity of service to the public, we will grandfather existing FSS earth station sites indefinitely.[74] We also believe that the Commission should not mandate relocation of FSS operations to other bands because FSS and terrestrial operations, as limited by this *First Report and Order*, are not fundamentally incompatible.[75] We are not, however, precluding voluntary negotiations between existing FSS licensees and new terrestrial licensees for relocation where feasible.

25. We realize that grandfathering existing FSS earth station sites will impose constraints on new terrestrial operations. However, in many cases these new terrestrial fixed and mobile operations should be able to co-exist with existing FSS earth stations by "engineering in" facilities to avoid interference. Furthermore, many rural, remote and less densely populated areas that could benefit significantly from deployment of terrestrial fixed and mobile services are not effected by existing grandfathered FSS earth station sites. Thus, we conclude that grandfathering existing FSS earth station sites will not unreasonably constrain the new terrestrial services.

26. In order to facilitate continued grandfathered FSS operations, we consider the establishment of coordination zones around grandfathered FSS earth station sites as part of the service rules which are discussed in the *Second Notice* below.[76] Within these coordination zones we propose that, terrestrial service operations must be coordinated with grandfathered FSS operations to ensure that the FSS operations are protected from interference from terrestrial service operations. Within these coordination zones, grandfathered FSS operations will have co-primary status with the new terrestrial services. We recognize that within these coordination zones, there will be exclusion zones where terrestrial services will not be able to operate without causing harmful interference to FSS. Such exclusion zones cannot be generally determined and will vary from site to site. These coordination zones differ from the exclusion zones mentioned earlier. A coordination zone refers to a specified geographical area where terrestrial and satellite licensees can co-exist subject to coordination procedures. An exclusion zone is not geographically defined and refers to the area within the coordination zone where sharing is not technically feasible.

b. New Fixed Satellite Service Operations

27. In the *Notice and Order,* the Commission stated that it would no longer accept applications in the 3650-3700 MHz band for new FSS earth stations, major amendments to pending FSS earth station applications, or applications for major changes in existing FSS earth stations.[77] This freeze was imposed to ensure that adequate opportunities would continue to exist for the provision of FS operations in the band.[78]

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[74] Earth station sites are grandfathered for the frequencies they are authorized to operate on pursuant to their license. We note that some existing earth stations are not authorized to use the entire 3650-3700 MHz band. *See* Appendix F at Table 2.

[75] *See* ¶¶ 102-106, *infra.*

[76] *Id.*

[77] *See Notice and Order*, 14 FCC Rcd at 1296-97 and 1305-06 (¶¶ 2, 13-14).

[78] *Id.* at 1296-97 (¶ 2).

28. In response to concerns raised by satellite operators and their accompanying requests for emergency relief from the freeze, the Commission issued a *Memorandum Opinion and Order* ("*MO&O*") modifying the earth station freeze by allowing the acceptance of applications for earth station facilities that were located within 10 miles of an existing grandfathered extended C-band earth station in the 3650-3700 MHz band.[79] The Commission found that this limited relief from the freeze would enable satellite operators to meet immediate needs without jeopardizing future availability of the 3650-3700 MHz band for FS operations.[80]

29. In the *MO&O*, the Commission did not establish a time limit for the filing of FSS earth station applications. However, because the new FSS facilities permitted by the *MO&O* could affect the use of the 3650-3700 MHz band by the terrestrial services, we now find it necessary to establish a limit on the acceptance of such applications and on the construction of FSS facilities. Accordingly, applications for FSS earth stations in the 3650-3700 MHz band within 10 miles of the authorized coordinates of an existing grandfathered earth station submitted prior to December 1, 2000 and subsequently authorized for service by the Commission will be co-primary with the terrestrial services. Such FSS earth stations will be grandfathered as described above.[81] We consider the filing of an FSS earth station application before the cut-off date to be an expression of immediate need consistent with the intent of the *MO&O*. However, applicants will be required to complete construction and be operational within one year from the date of initial authorization.[82] If a license for an FSS earth station at a grandfathered site is assigned or transferred, the earth station will retain its grandfathered status, provided there is no change in the site coordinates. In addition, certain modifications are permitted to the extent there is no change in the site coordinates.[83] Such modifications should be minor in nature and can include changes in the polarization and antenna orientation. However, changes such as an increase in the height of the center line of the dish or a change in geographical coordinates of greater than one second in either latitude or longitude would not be considered minor. Further, any change in the earth station antenna dish size that increases the likelihood of receiving interference will not be considered a minor change in facilities. If a license for a grandfathered FSS station is forfeited pursuant to Section 25.161(c) of the Commission's rules, the site will no longer be considered primary and will lose its grandfathered status.[84]

30. Subsequent to the end of the filing window, we will continue to accept applications for additional FSS earth stations. These authorizations, however, will be provided on a secondary basis only in the 3650-3700 MHz band. Secondary status will apply for new earth station sites located both inside and outside the coordination zones. We note that FSS earth stations only receive signals in this band,

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[79] *See MO&O*, 15 FCC Rcd at 9340 (¶ 2).

[80] *Id.* at 9341-42 (¶ 4).

[81] A list of the coordinates of the currently existing FSS earth station sites that must be protected is included in Appendix F. The Commission will issue a public notice after the December cutoff date which will include the coordinates of any additional FSS sites that attain grandfathered status and must be protected. In addition, a subsequent Report and Order in this proceeding and Public Notices will provide the coordinates of all known sites requiring protection.

[82] *See* 47 C.F.R. § 25.133(a).

[83] Consistent with our current practice, we would not view a change of one second in latitude or longitude as a change in coordinates.

[84] *See* 47 C.F.R. § 25.161(c).

and thus cannot cause interference. We also note that secondary FSS earth stations are not entitled to protection from primary terrestrial operations. We find that allowing additional FSS expansion on a secondary basis will help alleviate congestion in the adjacent C-band (3700-4200 MHz) and allow FSS providers to market available capacity, while preserving opportunities for a viable terrestrial services. In addition, allowing additional FSS earth stations on a secondary basis may enable FSS providers licensed under Part 25 to enter into private arrangements with terrestrial service licensees in the secondary market for access to this spectrum. We note, however, that an agreement between a terrestrial service licensee and an FSS operator would not elevate an FSS earth station in this band to primary status relative to other FS licensees. [85]

c. Telemetry, Tracking, and Control (TT&C) Operations

31. Echostar requests that the Commission clarify, as part of this proceeding, that Directsat will be able to continue its TT&C operations in the 3650-3700 MHz band.[86] Echostar notes that the Commission's authorization allowing Directsat to provide TT&C operations from 3698.3-3699.7 MHz was conditioned based on a "non-interference, non-protected basis."[87] Echostar asserts that it is essential to the continued safety of its satellite system that new services not cause interference to its TT&C operations, and that it not be required to protect new services.[88] Echostar states that it is confident that its TT&C operations can be accommodated without imposing undue restrictions on these services except in a "sliver" of spectrum and in a "few geographical locations."[89] Echostar further notes that loss of its satellite system would not be in the public interest since it would disrupt its ability to provide service to its more than to 2 million DBS subscribers and would greatly diminish its ability to furnish competition to incumbent cable operators.[90] Consistent with our regulatory treatment of existing FSS earth stations, we will grandfather the sites currently used to provide TT&C operations, including Echostar's.[91] As a result those sites will receive the same protections as the other grandfathered FSS earth stations in the 3650-3700 MHz band, except that they will be protected only for the frequencies they are authorized to use for TT&C operations. Any other TT&C operations site that receives grandfathering protection in the 3650-3700 MHz band will also be protected only for the specific frequencies the site is authorized to operate on pursuant to the license it holds.

32. Several commenters assert that the Commission failed to consider a petition ("TT&C petition") that was filed jointly by Echostar, GE Americom, HCI, KaStar, Lockheed Martin Corporation, Orion, PanAmSat and Visionstar, Inc., requesting that 10 MHz of spectrum in the 3600-3700 MHz band

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[85] The terms under which a licensee can enter into a lease or other private contractual arrangement regarding use of licensed spectrum is one of the issues that the Commission has under consideration as part of its secondary markets initiative. *See* "FCC Announces Public Forum on Secondary Markets in Radio Spectrum," *Public Notice* (rel. April 13, 2000) (announcing public forum in connection with Commission initiative to develop rules and policies to promote secondary markets in radio spectrum).

[86] *See* Echostar comments at 2.

[87] *See In the Matter of Directsat Corporation*, Order, 11 FCC Rcd 22375, 22378-79 (¶ 11).

[88] *See* Echostar comments at 2.

[89] *Id.* at 4-5.

[90] *Id.*

[91] *See* Appendix F at Tables 3 and 4.

be designated for TT&C use for satellite systems operating above the Ka band (*i.e.* above 15 GHz).[92] The Commission did place the TT&C petition on *Public Notice* seeking comment on the requested 10 MHz allocation.[93] We also referred this petition to NTIA, via the Interdepartment Radio Advisory Committee ("IRAC"), requesting that it consider the proposed operations in the 3600-3650 MHz band.[94] NTIA has responded that the proposed TT&C operations appear to be incompatible with Government operations in the 3600-3650 MHz band. NTIA recommends using non-Government spectrum in the 3650-4200 MHz band to satisfy the requirements indicated in the TT&C petition.[95]

33. We deny the TT&C petition's request for a reservation of 10 MHz of spectrum in the 3650-3700 MHz band for TT&C operations. We find that reserving 10 MHz of spectrum for TT&C operations for a few earth station sites would be an inefficient use of limited spectrum resources. We have determined that the public interest will be best served by adopting a regulatory framework that will foster the development and deployment of terrestrial services in the 3650-3700 MHz band. Nothing in Part 2 of the Commission's rules prohibits TT&C operations under the FSS allocation in this band, or from grandfathered FSS earth station locations, provided the non-TT&C operations of the satellite system include operations in the fixed satellite service. We address the other aspects of the petition in the *Second Notice*. Specifically, we seek comment on whether Part 25 of the Commission's rules should be modified to permit TT&C operations in the extended C-bands, even though those bands may be outside the band through which a satellite's principal services are offered.[96]

3. Non-Government Radiolocation Operations

34. In the *Notice and Order*, the Commission requested comment on a proposal to delete the unused secondary non-Government radiolocation service allocation in the 3650-3700 MHz band.[97] Northern Telecom, Inc. ("Nortel") supports the proposal and encourages the Commission to align U.S. policy with ITU radio regulations that do not allow commercial radiolocation operations in the band.[98] No comments were filed supporting the continued secondary allocation for the unused non-Government radiolocation service and we find no sufficient reason to maintain the secondary unused allocation. Accordingly, we adopt the proposal and delete the unused secondary non-Government radiolocation allocation to preserve the availability of the spectrum for use by the terrestrial services and FSS operations. We note that sufficient spectrum remains available within the 2900-3650 MHz band, on a secondary basis, to accommodate non-Government radiolocation service needs.

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[92] *See* Petition for Rulemaking filed on August 7, 1997 in RM-9411.

[93] *See Public Notice*, Report Number 2306, dated November 23, 1998.

[94] *See* letter dated March 12, 1999, from Dale Hatfield, Chief, OET to Mr. William Hatch, Acting Associate Administrator, NTIA.

[95] *See* letter dated November 2, 1999 from William T. Hatch, Acting Associate Administrator, NTIA to Dale Hatfield, Chief, OET ("*November NTIA letter*").

[96] See ¶¶ 129-132, *infra.*

[97] *See Notice and Order*, 14 FCC Rcd at 1307 (¶ 15).

[98] *See* Nortel comments at iii, 13.

B. Federal Government Operations

1. Radiolocation Operations

35. In the *Notice and Order,* we noted that, as a condition of the transfer of the 3650-3700 MHz band to a mixed-use status, three Government radiolocation sites would be allowed to operate indefinitely in the band within an 80-kilometer "radius of operation" surrounding each site.[99] NTIA indicates that a coordination distance of 80 kilometers around these three sites will provide adequate identification of spectrum conflicts, and that the Commission should coordinate any non-Government terrestrial service or FSS station within 80 kilometers of these sites with NTIA's Frequency Assignment Committee on a case-by-case basis.[100] In the *Notice and Order,* we requested comment on what actions should be taken to achieve this coordination in a manner to promote the ability of new non-Government services to co-exist with extremely high powered Government mobile radar systems in the adjacent 3300-3650 MHz band as well as with occassional high powered in-band use at three grandfathered Government radiolocation sites.[101]

36. We did not receive any proposals specifically addressing the questions raised in the *Notice and Order* regarding coordination with these sites.[102] Innowave expressed support for NTIA's proposal for coordination of any station within 80 kilometers of the Government radars; however, it recommends that the coordination range apply to base stations only, and not to stations located at customer premises.[103] Because the requirement to protect the three grandfathered Government radiolocation sites at an 80 kilometer distance is a condition of the transfer of this spectrum, we adopt NTIA's proposal for an 80 kilometer coordination radius to ensure that these sites will be protected from interference. This requirement means that non-Government terrestrial service and FSS stations located within 80 kilometers of the three grandfathered Government radiolocation stations may not cause interference to the grandfathered Government radiolocation operations, that they must accept any interference received from such operations, and that they must be coordinated before commencing operation. The coordination requirement will apply to all non-Government stations, not just base station operations as requested by Innowave, because any station within the coordination zone could potentially cause interference to the protected Government operations. Given that coordination is required only for areas within 80 kilometers of three grandfathered Government radiolocation sites, we find that this should affect a limited number of non-Government stations. We adopt this coordination requirement in a footnote to the Table of Allocations contained in Section 2.106 of the Commission's rules. The coordination procedures will be addressed as part of the service rules in the attached *Second Notice.*[104]

37. In the *Notice and Order*, the Commission proposed to delete the Government radiolocation service allocation from the 3650-3700 MHz band, except for grandfathering three Government

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[99] *See Notice and Order*, 14 FCC Rcd at 1298-99 (¶ 4). The three grandfathered sites are at St. Inigoes, Maryland, Pascagoula, Mississippi, and Pensacola, Florida.

[100] *See November NTIA letter* referenced at note 95, *supra.*

[101] *See Notice and Order*, 14 FCC Rcd at 1303-04 (¶ 11).

[102] Petroleum Communications, Inc. ("PetroCom") made general comments about coordination with military operations, however, these were directed at adjacent band operations.

[103] *See* Innowave comments at 4.

[104] *See* ¶¶ 102-109, *infra.*

radiolocation sites that would continue operations in the band.[105] The Commission also proposed to permit Government radiolocation operations in the 3650-3700 MHz band on Naval vessels at an appropriate distance from shore.[106] NTIA recommends the inclusion of a footnote to the Table of Frequency Allocations indicating that off-shore Government radiolocation operations may operate on a non-interference basis with authorized non-Government operations, and may not hinder the implementation of any non-Government operations.[107] NTIA recommends that a distance of 30 nautical miles (55.5 kilometers) from shore be specified.[108] It notes that this recommended distance is based upon limited information, and that a different distance may later be found appropriate after further measurements and experience with non-Government use of the 3650-3700 MHz band.[109] SR Telecom believes that the Government radiolocation allocation should be deleted or restricted to areas beyond 50-70 statute miles from shore.[110] PetroCom recommends that the limit be set at no more than 3 nautical miles.[111] Neither PetroCom nor SR Telecom submitted detailed technical analysis justifying alternative distances.

38. After carefully reviewing the comments concerning this issue, we find that NTIA's recommended distance of 30 nautical miles[112] from the shore of the U.S. or its territories may be insufficient to protect non-Government services that will operate in the band. We note that NTIA has indicated previously that the operational radius of the three grandfathered Government radiolocation operations is 80 kilometers.[113] We note that 80 kilometers is approximately equal to 44 nautical miles.[114] We are concerned that allowing operation of Government radiolocation stations any closer than 44 nautical miles (80 kilometers) to the U.S. or its territories will have the potential to cause interference to non-Government operations in the band. Therefore, we specify a distance of 44 nautical miles, which is equivalent to the 80 kilometers grandfathered Government radiolocation "radius of operation" as described in the *Notice and Order*.[115] NTIA's request to include the Government radiolocation allocation via a footnote, as described, will not hinder the introduction of non-Government services in the band, given the 80-kilometer protection limit. Additionally, offshore Government radiolocation stations will not be allowed to cause interference to non-Government stations, irrespective of their location. Further, if additional technical information and analysis is made available to us concerning any change in the distance requirements, we will consider altering the distance as appropriate.

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[105] *See Notice and Order*, 14 FCC Rcd at 1307 (¶ 16).

[106] *See Notice and Order*, 14 FCC Rcd at 1307 (¶ 16).

[107] *See November NTIA letter* referenced at note 95, *supra*.

[108] *Id.*

[109] *Id.*

[110] *See* SR Telecom comments at 5-6.

[111] *See* PetroCom comments at 4.

[112] 1 nautical mile = 1.15 statute miles.

[113] *See Spectrum Reallocation Final Report, Response to Title VI - Omnibus Budget Reconciliation Act of 1993,* NTIA Special Publication 95-32, released February 1995.

[114] 1 statute mile = 1.609 kilometers

[115] *See Notice and Order* 14 FCC Rcd at 1298-99 (¶ 4).

2. Aeronautical Radionavigation Allocation

39. In the *Notice and Order*, we proposed to delete the unused Government aeronautical radionavigation service (ground based) allocation in the 3650-3700 MHz band.[116] SR Telecom believes that the aeronautical radionavigation allocation should be deleted because it may limit future use of the 3650-3700 MHz band.[117] NTIA did not object to this proposal. We see no useful purpose in continuing this allocation. Therefore, for the reasons set forth in the *Notice and Order*, we adopt our proposal to delete the Government aeronautical radionavigation service (ground based) allocation from the 3650-3700 MHz band to preserve the band for non-Government use.

IV. SECOND NOTICE OF PROPOSED RULE MAKING

40. In this *Second Notice*, we propose licensing and operating rules for FS and mobile service (base stations only) operations in the 3650-3700 MHz band. In light of the fact that this spectrum has been allocated to terrestrial service operations on a co-primary basis for assignment by competitive bidding pursuant to Section 3002 of the BBA,[118] we propose to assign terrestrial service licenses in this band pursuant to the Commission's Part 1 competitive bidding rules. We also propose to license the 3650-3700 MHz band under Part 27 of the Commission's rules, as modified herein, to reflect the particular characteristics and circumstances of services offered through the use of spectrum in the 3650-3700 MHz band. In addition, we seek comment on the feasibility of pairing this band with the 4940-4990 MHz ("4.9 GHz") band for use for fixed and mobile services.

A. Application, Licensing, and Processing Rules

41. In the *Notice and Order* in this proceeding, we sought comment on whether the 3650-3700 MHz band should be licensed under the Local Multipoint Distribution Service ("LMDS" or Part 101, Subparts L and M) rules or under the Wireless Communications Service ("WCS" or Part 27) service rules, or under an entirely new set of service rules.[119] In addition, we sought comment on the initial spectrum licensing blocks.[120] Specifically, we sought comment on whether the 3650-3700 MHz band should be licensed as a single 50-megahertz block or broken down into two or more blocks.[121] If the latter, we asked if the spectrum should be initially offered as contiguous or paired blocks and, if paired blocks, whether they should be symmetric or asymmetric.[122] In addition, we sought comment on the appropriate geographic size of service areas for initial licensing.[123] Specifically, we sought comment on whether the band should be initially licensed for a single nationwide service area, for several large

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[116] *See Notice and Order*, 14 FCC Rcd at 1307 (¶ 16).

[117] *See* SR Telecom comments at 5.

[118] As explained above, the 3650-3700 MHz band is a permissible substitute for 15 MHz of spectrum at 1990-2110 MHz, which the BBA directs the Commission to assign by competitive bidding. *See* ¶¶ 6, 19, *supra.*

[119] *See Notice and Order*, 14 FCC Rcd at 1303 (¶ 10).

[120] *Id.*

[121] *Id.*

[122] *Id.*

[123] *Id.*

regional service areas, or for some other choice of smaller geographic areas.[124]

42. Since the release of the *Notice and Order*, there have been several developments that lead us to seek additional comment on these issues, as well as the additional proposals set forth below. As discussed above, we have allocated the 3650-3700 MHz band to the terrestrial services on a nationwide basis and have grandfathered 82 non-Federal Government FSS earth stations at 49 sites[125] and three Federal Government radiolocation operations sites on a co-primary basis. We have also decided to accept on a secondary basis new FSS earth station applications. In addition to these decisions, earlier this year we released a Notice of Proposed Rulemaking for the 50 megahertz of spectrum in the 4940-4990 MHz band ("*4.9 GHz Notice*").[126] In the *4.9 GHz Notice*, we proposed to allocate the 4.9 GHz band to the non-Federal Government fixed and mobile services, except aeronautical mobile service, on a nationwide co-primary basis. We also proposed to license the 4.9 GHz band under Part 27 of the Commission's rules and sought comment on the appropriate spectrum licensing blocks and geographic service areas to be adopted.

43. Both the 4.9 GHz band and the 3650-3700 MHz bands have been transferred from Federal Government use to private sector use. Both bands include 50 megahertz of spectrum. The 3650-3700 MHz band is allocated for fixed and mobile services on a nationwide co-primary basis and we have proposed to allocate the 4.9 GHz band for fixed and mobile services on a nationwide co-primary basis. We believe that a possibility exists that fixed and mobile service providers could pair these two frequency bands and we seek comment on this possibility and on what licensing and service rules we should adopt to encourage this result. We recognize that the mobile allocation for the 3650-3700 MHz band is restricted to base stations only. However, we believe that land mobile receivers might be able to use the 4940-4990 MHz band to transmit to land mobile base stations operating in the 3650-3700 MHz band. We are hopeful that if these two bands are paired they could be used to provide a broad range of new fixed and mobile services, directly linking residences, businesses, and other locations to an ever-developing array of networks. Given the allocation we have adopted for the 3650-3700 MHz band and the possibility of pairing that band with the 4.9 GHz band, we seek additional comment on the application and licensing issues raised in the *Notice and Order*.

44. We wish to develop a record on whether technical requirements or other reasons justify licensing the 3650-3700 MHz and 4.9 GHz bands at the same time. Commenters have voiced support for the adoption of certain modulation standards, such as TDD or FDD, and the use of associated pairing schemes.[127] We are encouraged by comments in the record indicating that TDD technology is well suited for operation in the 3650-3700 MHz band and could be used to provide service in this band.[128]

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[124] *Id.*

[125] Existing incumbent earth stations and any new applications meeting the criteria articulated in the *MO&O*, submitted prior to December 1, 2000, and subsequently authorized for service by the Commission and that commence operation within one year of initial authorization will be grandfathered on a co-primary basis.

[126] *See 4.9 GHz Notice*, 15 FCC Rcd at 4778.

[127] *See* InnoWave comments at 3-4. *See also* SR Telecom comments at 9-10; Rural Carriers comments at 5-6.

[128] *See* Innowave comments at 2. Additionally, Rural Carriers notes that a 50 MHz block of spectrum in the 3 GHz band could potentially support wireless Internet access with data rates surpassing digital subscriber line ("xDSL") services, such as cable modems into remote, rural areas of the country. *See* Rural Carriers comments at 4.